

Remarks

Reconsideration of this application as amended is respectfully requested.

Claims 1-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,146,410 of *Kawamura et al.* ("*Kawamura*") and U.S. Patent No. 5,566,180 of *Eidson et al.* ("*Eidson*").

Claims 1-17 have been cancelled. New claims 18-34 have been added.

Applicants respectfully submit that new claim 18 is not obvious in view of *Kawamura* and *Eidson*. New claim 18 is a motion control system includes a set of control nodes each for controlling a single axis of the motion control system. In contrast, *Kawamura* discloses a control apparatus 20 that controls three axes of a motion control system together. (*Kawamura*, col. 2, line 21).

Moreover, the motion control system of new claim 18 coordinates the application of the control values to the axes by selecting the trigger times for the control values and synchronizing the times in clocks contained in the control nodes. In contrast, *Kawamura* teaches coordinating the application of control values to the axes by grouping together the axes. (*Kawamura*, col. 2, lines 42-46). For example, *Kawamura* teaches that

The axes in the groups are caused to start simultaneously moving in response to the information with respect to the grouping of the axes sent from the programmable machine controller.  
(*Kawamura*, col. 1, lines 65-69) (emphasis added). In contrast to such simultaneous group triggering as taught by *Kawamura*, the motion control system of new claim 18 enables selection of trigger times independently among any of the axes because each control node controls motion along a single axis rather than groups of axes.

Furthermore, the control nodes of new claim 18 obtain information pertaining to the application of

control values via a network. In contrast, the control apparatus 20 of *Kawamura* obtains command values and execution times via a RAM buffer. (*Kawamura*, col. 2, lines 23-24).

*Eidson* discloses methods for clock synchronization but does not disclose or suggest the limitations of new claim 18 for coordinating the application of the control values to the axes of a motion control system.

It is further submitted that *Kawamura* does not teach or suggest a combination with *Eidson* and *Eidson* does not teach or suggest a combination with *Kawamura*. It would be impermissible hindsight based on an applicant's own disclosure to incorporate the clock synchronization of *Eidson* into the control system of *Kawamura*. Moreover, any such combination would still lack the limitations of providing information pertaining to trigger times to control nodes and coordinating the application of the control values as claimed in new claim 18.

Given that new claims 19-22 depend from new claim 18, it is submitted that new claims 19-22 are not obvious in view of the references cited by the Examiner.

It is also submitted that new claim 23 is not obvious in view of *Kawamura* and *Eidson*. New claim 23 includes limitations similar to the limitations of new claim 18 including control nodes for controlling a single axis and coordinating the application of the control values to the axes by selecting the trigger times for the control values and synchronizing the times in clocks contained in the control nodes. Therefore, the remarks stated above with respect to new claim 18 also apply to new claim 23.

Furthermore, the control nodes of new claim 23 include pre-computed control values and trigger times for multiple motion control functions and a selector node that specifies an appropriate motion control function for

each axis independently. In contrast, the command values in the system *Kawamura* are fed directly from a programmable machine controller in groups. (*Kawamura*, col. 2, lines 18-21).

Given that new claims 24-26 depend from new claim 18, it is submitted that new claims 24-26 are not obvious in view of the references cited by the Examiner.

It is further submitted that new claim 27 is not obvious in view of *Kawamura* and *Eidson*. New claim 27 includes limitations similar to the limitations of new claim 18. Therefore, the remarks stated above with respect to new claim 18 also apply to new claim 27.

Given that new claims 28-34 depend from new claim 27, it is submitted that new claims 28-34 are not obvious in view of the references cited by the Examiner.

It is respectfully submitted that in view of the amendments and arguments set forth above, the applicable objections and rejections have been overcome.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-1078 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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